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EXAMINER

MYERS, JESSICA L

ART UNIT

PAPER NUMBER

4124

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/511,753	Applicant(s) KAROLIUSSEN, HILBERG	
	Examiner JESSICA L. MYERS	Art Unit 4124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/19/04</u> . | 6) <input type="checkbox"/> Other: _____ |

Specification

1. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are: The term "communicator (page 4, line 13)" appears to be used interchangeably with the term "commutator (page 6, line 12)". Additionally, page 4 line 8 states "figure 4 is a cross section of figure 4," making it unclear what figure 4 is a cross section of.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-10 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

The following errors are given by way of example. The compound nature of the error precludes a complete listing of every error, and applicant and his representative should carefully review and correct the claims.

In Reference to Claim 1

Claim 1 recites the limitation "the bearing of the co-rotors" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

The language of claim 1 is generally unclear and imprecise. For example, claim 1 reads "an eccentric inner rotor is supported in axles" while it should read "an eccentric inner rotor is supported on axles." Claim 1 also states "on each side is enclosed in an enclosure where it on each sides of the bearing is arranged a rotating lip seal," which should read similar to "and the inner rotor and co-rotors are encased by an enclosure which supports bearings on each side of the rotors. A rotating lip seal is arranged on said bearings..." Claim 1 also reads "where through holes through the co-rotor's sidewalls and bearing enclosure, its volume within the liquid ring is aired to the surrounding enclosure, and ensures that it is not created a differential pressure across the bearings and the seals of the bearings" which should read similar to "where the co-rotor and bearing enclosure has sidewalls containing through holes that lead to the surrounding enclosure, which ensures that a differential pressure is not created across the bearing." Appropriate correction is required. The claim has been examined as if these corrections were in place.

In Reference to Claim 2

Claim 2 is dependent on claim 1, and is rejected for the reasons cited in the rejection of claim 1 above.

In Reference to Claim 3

Claim 3 recites the limitation "the cells of the rotor" and "the rotor" in lines 2 and 4. There is insufficient antecedent basis for this limitation in the claim.

The language of claim 3 is generally unclear and imprecise. Claim 3 reads "characterized by the cells of the rotor has radial canal openings on each side surrounded by a circular smooth section," which should read similar to "such that the rotor has cells with radial canal openings on each side, where the openings are surrounded by a circular smooth section." Appropriate correction is required. The claim has been examined as if these corrections were in place.

In Reference to Claim 4

Claim 4 recites the limitations "the commutator," "the compression sector," "the rims," "the canal opening," "the cells," and "the rotor" in lines 2, 3, and 4. There is insufficient antecedent basis for these limitations in the claim.

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationship between the hole and the commutator, what the rims of the canal opening are, where the liquid beams are coming from, etc.

In Reference to Claim 5

Claim 5 recites the limitation "the commutator" in line 2. There is insufficient antecedent basis for this limitation in the claim.

The language of claim 5 is generally unclear and imprecise. Claim 5 reads “characterized by that the commutator on each side has peripheral grooves, where injection liquid exist under pressure and inhibit gas leaks,” which should read similar to “with a commutator, where each side of the commutator has peripheral grooves that hold pressurized injection liquid to prohibit gas leaks .” Appropriate correction is required. The claim has been examined as if these corrections were in place.

In Reference to Claim 6

Claim 6 recites the limitations “the commutator,” “the gap,” and “the rotor” in lines 2 and 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: it is unclear how the periphery of the commutator is outside the co-rotor’s bearing seals, and it is unclear where the leaking water is coming from.

In Reference to Claim 7

Claim 7 is dependent on claim 1, and is rejected for the reasons cited in the rejection of claim 1 above.

In Reference to Claim 8

Claim 2 is dependent on claim 1, and is rejected for the reasons cited in the rejection of claim 1 above.

In Reference to Claim 9

Claim 9 provides for the use of a compressor according to claim 1, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

In Reference to Claim 10

Claim 10 provides for the use of a compressor according to claim 1, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 9 and 10 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

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Note: In view of the numerous errors under 35 USC 112 second paragraph and the rejections under USC 101, the claims have been treated on prior art as best understood. Claims 4 and 6 were not sufficiently understood to apply art, and it should be noted that the absence of an art based rejection should not be construed as an indication of allowable subject matter.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3, 7, 8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 98/05866 to Pyrhonen (Pyrhonen), first published February 12, 1998, in view of U.S. Patent 5,078,410 to Warman et al. (Warman et al.) and U.S. Patent 1,668,532 to Stewart (Stewart).

In Reference to Claim 1

Pyrhonen teaches:

A liquid ring compressor (liquid ring machine, see figure 2), characterized by an eccentric inner rotor (blade wheel means (2)) is supported in axles (supports (15)) to an outer co-rotor for the liquid ring (casing part (11), which is assembled rotatably on the body (12)), where the bearing (bearings (16) for the casing part) of

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the co-rotors is outside the same axles (supports (15)). Pyrhonen also teaches that the whole assembly is encased by an enclosure (body (12)).

Pyrhonen fails to teach the use of a rotating lip seal on the bearing of the co-rotor, which at high speed is projected due to centrifugal forces out and lifts itself from the axles. Pyrhonen also fails to teach the use of through holes in the co-rotors sidewalls that ensure a differential pressure across the bearings is not created.

Warman et al. teach:

a lip seal (rotating sealing member (8)), where the lip abuts the axle (stationary cylindrical surface) at low speed, and at high speeds is projected outward due to centrifugal forces and lifts itself from the axles (see abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to include the seal of Warman et al. between the bearing and axles of the co-rotor in order to prevent fluid leakage between the two (see column 1, lines 4-7).

Stewart teaches:

a liquid ring pump with an inner rotary member (10) and an outer rotary member (17) (see figures 1 and 2), where the fluid used as a liquid piston is also stored in the apparatus' casing (25). The fluid is free to flow between the inner chamber of the outer rotary member (17) and the inside of the casing (25) via feed pipe (31) with inlet and outlet ends (33 and 32, located inside the shaft (3), which is in communication with the actual pumping chambers via passages (16), and outer casing (25)). It would have been obvious to one of ordinary skill in the art at the

time of invention to allow the working fluid of Pyrhonen to flow between the blade wheel chamber and apparatus casing as taught by Stewart so that this liquid could be supplied when the pump is started (see columns 2-3, lines 109-19), doing so would require at least one hole be made in the co-rotor of Pyrhonen et al.

In Reference to Claim 3

Pyrhonen as modified by Warman et al. and Stewart teaches the compressor according to claim 1 (see the rejection of claim 1 above), but does not teach that the cells of the rotor have radial canal openings on each side surrounded of a circular smooth section for sealing against a stationary commutator placed in the center of the rotor.

Stewart teaches a liquid ring pump with an inner rotary member (10) and an outer rotary member (17) (see figures 1 and 2), where the inner rotary member has cells that act as pump chambers (15) that are in communication with the inlet (6) and outlet (7) via openings (16) (see figure 2). These openings have a circular smooth section of the hub portion (12) disposed between them that attaches the hub to the shaft, which is stationary with respect to the hub (see column 1, lines 42-51). It would have been obvious to one of ordinary skill in the art at the time of invention to include the canal openings of Stewart on the apparatus of Pyrhonen so that the shaft could be used as the inlet and outlet for the pumped liquid.

In Reference to Claim 7

Pyrhonen as modified by Warman et al. and Stewart teaches the compressor according to claim 1 (see the rejection of claim 1 above), where the bearings for the co-rotor are of ball or roller bearings types (see figure 2a where the bearings (18) are shown to be ball bearings).

In Reference to Claim 8

Pyrhonen as modified by Warman et al. and Stewart teaches the compressor according to claim 1 (see the rejection of claim 1 above), where the bearings are slide bearings, including hydrodynamic types. Pyrhonen discloses that “the current supply arrangements, seals and bearings of the different rotating shafts can be implements in a per se known manner, for instance the bearings can be ball or slide bearings... (see page 3, paragraph 3).”

In Reference to Claim 10

Pyrhonen as modified by Warman et al. and Stewart teaches the compressor according to claim 1 (see the rejection of claim 1 above), as a compressor in a gas turbine plant. Pyrhonen discloses that “the skilled person is aware of various actuators, such as e.g. Liquid ring pumps, which are commonly used in applications relating to the transfer of fluid or pumping, such as in the processes and apparatus of the chemical industry, papermaking industry or food industry or in the pumping operations of power plants, waste water plants or similar (see page 1 paragraph 2).”

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pyrhonen, Warman et al., and Stewart as applied to claim 1 above, and further in view of U.S. Patent 2,771,860 to Falk (Falk).

Pyrhonen as modified by Warman et al. and Stewart et al., teaches the compressor according to claim 1 (see the rejection of claim 1 above), but does not teach that the rotor has a number of cells with half cylindrical shape in the periphery, where the arc is turned towards the center.

Falk teaches a liquid ring pump where the rotor has pumping chambers that are formed alternately wide and narrow (405a and 405b) (see column 3 lines 38-40 and figure 3). Figure 3 shows that the wide chambers are semi-circular or half cylindrical in shape, and that the arc is turned towards the center just as in applicant's figure 4. It would have been obvious to one of ordinary skill in the art at the time of invention to form the pumping chambers of Pyrhonen in the shape disclosed by Falk since Falk discloses several different shapes for the pump chamber cells (see figures 1, 3, and 5) and they can be used interchangeably.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pyrhonen, Warman et al., and Stewart as applied to claim 1 above, and further in view of U.S. Patent 5,769,609 to Plescher et al. (Plescher et al.).

Pyrhonen as modified by Warman et al. Stewart, and Dardis et al., teaches the compressor according to claim 1 (see rejection of claim 1 above), but does not teach

that the commutator has peripheral grooves on each side, where injection liquid exist under pressure and inhibit gas leaks.

Plescher et al. teach a liquid ring compressor see figure 1, with control disks (5) that encircles the shaft (8) of the rotor (4) and is connected to the compressor housing (1). The control disk (5) is formed with a distribution groove (10) that encircles the shaft (8) and is filled with the operating liquid, which serves as a seal between the control disk and the rotor hub. It would have been obvious to one of ordinary skill in the art at the time of invention to form a liquid filled groove between the edge of the side face of the rotor and the corresponding edge of the rotating element of Pyrhonen et al. as taught by Plescher et al. Doing so would seal the gap between the two elements, preventing leakage (see column 2 lines 27-51).

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pyrhonen, Warman et al., and Stewart as applied to claim 1 above, and further in view of U.S. Patent 5,197,863 to Dardis et al. (Dardis et al.).

Pyrhonen as modified by Warman et al. and Stewart teaches the compressor according to claim 1 (see the rejection of claim 1 above) but do not specify that water is used as injection liquid to pump air and water compatible gasses.

Dardis et al. teach that water can be used as a pumping liquid (see column 4 line 15), and the apparatus of Pyrhonen as modified by Warman et al., Stewart, and Dardis et al. could be used to pump any variety of liquid, including air and water compatible gasses. It would have been obvious to one of ordinary skill in the art at the time of

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invention that water could be used as the pumping fluid as taught by Dardis et al., and that the apparatus could be used to pump any variety of liquids, since Pyrhonen as modified by Warman et al., Stewart, and Dardis et al. did not specify the particular fluids used in the pumping process.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA L. MYERS whose telephone number is (571)270-5059. The examiner can normally be reached on Monday through Friday, 8:30am to 5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Bomberg can be reached on 571-272-4922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JLM/

/Kenneth Bomberg/

Supervisory Patent Examiner, Art Unit 4124